## Data Evaluation Report on the Acute Toxicity of Chlormequat chloride to Lemna gibba G3

_			8,000
PMRA Submission Number	{}	EPA MRID	Number 467152-21

Data Requirement:

PMRA DATA CODE {.....} EPA DP Barcode D325185 OECD Data Point {.....}

EPA MRID EPA Guideline

467152-21 123-2 (OPPTS 850.4400)

Test material: Chlormequat chloride

Purity: 753 g/L

Common name: CCC Technical

Chemical name: IUPAC: Not reported

CAS name: Not reported CAS No.: Not reported Synonyms: Not reported

Primary Reviewer: Brian D. Kiernan

Date: 04/24/06

EPA/EFED/ERBIV

Reference/Submission No.: {......}

[For PMRA] Company Code {.....} [For PMRA] **Active Code** {.....} Use Site Category: [For PMRA] {.....}

EPA PC Code

018101

Date Evaluation Completed: {dd-mm-yyyy}

CITATION: Hertl, J. 2001. Toxicity of CCC techn. to the aquatic plant Lemna gibba in a growth inhibition test. Unpublished study performed by Institute for Biological Analysis and Consulting IBACON GambH Rossdorf, Germany. Study No. 2001/7002203. Study sponsored by BASF Corporation, Agricultural Products, Research Triangle Park, NC. The final report issued May 23, 2001.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute toxicity of a pesticide to aquatic vascular plants. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-bycase basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.

#### **EXECUTIVE SUMMARY:**

In a 7-day acute toxicity study, the freshwater aquatic vascular plants (Duckweed, Lemna gibba G3) were exposed to Chlormequat chloride under static conditions. The nominal concentrations were 0.10, 0.32, 1.0, 3.2, 10.0, and 32.0 mg a.i./L with a negative control. The mean measured concentrations were 0.04, 0.34, 0.73, 2.4, 8.2, and 24 mg a.i./L (75-106% of nominal).

Frond number was the most sensitive endpoint, with an EC<sub>50</sub> of 2.6 mg ai/L. All endpoints were adversely affected at all but the lowest concentration. The NOAEC for the study was 0.04 mg ai/L. By 7 days, the percent inhibitions for mean live frond numbers were 7, 16, 36, 51, 66, and 74% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The percent inhibitions for area under the growth curve (biomass) were 3.8, 18.1, 30.9, 43.6, 59.0, and 72.1% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The percent inhibitions for growth rates were 1.0, 6.0, 15.9, 25.1, 38.5, and 47.6% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The percent inhibitions for dry weight were 3, 19, 28, 41, 57, and 65% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control.

This study is scientifically sound and satisfies the guideline requirement for an aquatic vascular plant study with Lemna gibba. The study is classified as ACCEPTABLE.

95% C.I.: 0.0063-0.051 mg ai/L

95% C.I.: 0.007-0.038 mg ai/L

95% C.I.: 3.8-6.5 mg ai/L

95% C.I.: 1.8-3.7 mg ai/L

#### **Results Synopsis**

EC50:

EC50:

Test Organism: Lemna gibba G3

Test Type (Flow-through, Static, Static Renewal): Static

Frond Number:

0.018 mg ai/L ECos:

2.6 mg ai/L

NOAEC: 0.04 mg ai/L

Probit Slope: 0.763±0.0564

Dry Weight:

EC<sub>05</sub>: 0.016 mg ai/L

5.0 mg ai/L

NOAEC: 0.04 mg ai/L

Probit Slope: 0.661±0.0375

Endpoints affected: Frond number, biomass, growth rate and dry weight

Most sensitive endpoint: frond number

#### I. MATERIALS AND METHODS

#### GUIDELINE FOLLOWED:

The test protocol was based on the following guidelines: OECD Draft Guideline "Lemna Growth Inhibition Test" (June 1998) and U.S. Environmental Protection Agency Series 850-Ecological Effects Test Guidelines (draft), OPPTS Number 850.4400, Aquatic Plant Toxicity Test Using Lemna spp., Tiers I and II. The deviations from this guideline

(850.4400) included:

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 The dilution water characteristics of TOC, particulate matter, metals, pesticides, and chlorine content were not reported.

2. The pretest health of the Lemna culture was not reported

3. The number of fronds per replicate (11) was less than recommended (15).

COMPLIANCE:

Signed and dated GLP, Quality Assurance and No Data Confidentiality statements were provided. The test was conducted according to the OECD and Germany's "Chemicals Act" Good Laboratory Practices.

A. MATERIALS:

1. Test material

Chlormequat chloride

Description:

Light yellow liquid

Lot No./Batch No.:

061000

Purity:

753 g/L

Stability of compound

under test conditions:

The stability of the test substance in the dilution water during the course of the study was demonstrated by analytical determinations at 0 and 7 days. The mean recoveries at all treatment levels were 72-106% of nominal.

(OECD recommends water solubility, stability in water and light, pKa, Pow, and vapor pressure of test compound)

Storage conditions of

test chemicals:

Stored at room temperature in the dark.

Physicochemical	properties	of Chlormequat	chloride.
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Parameter	Values	Comments
Water solubility	Completely miscible	
Vapor pressure	Not reported	-
UV absorption	Not reported	
pKa	Not reported	
Kow	Not reported	

#### 2. Test organism:

Name: Duckweed, Lemna gibba

EPA requires a vascular species: Lemna gibba.

Strain, if provided: G3

Source: Maintained at study laboratory (originally obtained from the Institut fur Landschafts und

Pflanzenokologie, Universitat Hohenheim, Stuttgart, Germany).

Age of inoculum: 7 days old

Method of cultivation: 20X AAP-Growth Medium

#### B. STUDY DESIGN:

#### 1. Experimental Conditions

- a. Range-finding Study: The definitive test concentrations were based on a non-GLP range-finding study. The results of this study were not reported.
- b. Definitive Study

Parameter	Details	Remarks
		Criteria
Acclimation period:	7 days	
Culturing media and conditions: (same as test or not)	20X AAP-Growth Medium; same as test.	
Health: (any mortality observed)	Not reported	
Test system Static/static renewal Renewal rate for static renewal	Static N/A	EPA expects the test concentrations to be renewed every 3 to 4 days (one renewal for the 7 day test, 3-4 renewals for the 14 day test).

Parameter	Details	Remarks
		Criteria
Incubation facility	Environmental chamber	
Duration of the test	7 days	-
		EPA requires a duration of 14 days. Seven day studies will be accepted for review by the Agency.
Test vessel Material: (glass/stainless steel) Size: Fill volume:	Glass flasks 250 mL 150 mL	Test vessels covered with glass dishes.
Details of growth medium name pH at test initiation: pH at test termination: Chelator used: Carbon source:	20X AAP-Growth Medium 7.5-7.6 8.5-9.1 Yes NaHCO <sub>3</sub>	EPA recommends the following culture media: Modified Hoagland's E+ or 20X-AAP. Chelators are not recommended.
If non-standard nutrient medium was used, detailed composition provided (Yes/No)	N/A	
Dilution water source/type: pH: water pretreatment (if any): Total Organic Carbon: particulate matter: metals: pesticides: chlorine:	Deionized water Analytical grade salts added. 7.5 (adjusted with 0.1 M HCl) Filtered (0.2-µm) Not reported	The dilution water characteristics of TOC, particulate matter, metals, pesticides, and chlorine content were not reported.  EPA recommends a pH of ~5.0. A solution pH of 7.5 is acceptable if type 20X-AAP nutrient media is used.
Indicate how the test material is added to the medium (added directly or used stock solution)	Stock solution	
Aeration or agitation	None reported.	

Parameter	Details	Remarks
	*	Criteria
Sediment used (for rooted aquatic vascular plants) Origin: Textural classification (%sand, silt, and clay): Organic carbon (%): Geographic location:	Not applicable	
Number of replicates Control: Solvent control: Treatments:	3 N/A 3	
Number of plants/replicate	2-4 plants/replicate	EPA requires 5 plants.
Number of fronds/plant	Total of 11 fronds/replicate	The number of fronds per replicate (11) was less than recommended (15).  EPA requires 3 fronds per plant.
Test concentrations Nominal:  Measured:	0.10, 0.32, 1.0, 3.2, 10.0, and 32.0 mg ai/L 0.04, 0.34, 0.73, 2.4, 8.2, and 24 mg	The mean measured concentrations were reviewer-calculated using analytical results of day 0 and 7 samples (Table 4 of the analytical report, pages 44-47).
	ai/L	Measurements of the lowest test concentration were below the LOQ (0.10 mg a.i./L) for three of the four replicates; therefore, the reviewer used ½ the LOD (0.03 mg/L) to calculate the average concentration for this test level.
		EPA requires at least 5 test concentrations with a dose range of 2X or 3X progression.
Solvent (type, percentage, if used)	N/A	
Method and interval of analytical verification	Ion chromatography at days 0 and 7; LOQ = 0.10 mg/L.	

Parameter	Details	Remarks
		Criteria
Test conditions Temperature: Photoperiod: Light intensity and quality:	24°C Continuous 8350-8900 lux, fluorescent light	
Reference chemical (if used) name: concentrations:	None	
Other parameters, if any	None	

#### 2. Observations:

Table 2: Observation parameters

Parameters	Details	Remarks/Criteria
Parameters measured (e.g.,: number of fronds, plant dry weight or other toxicity symptoms)	Number of fronds, area under the growth curve (biomass), growth rate, and dry weight.	
Measurement technique for frond number and other end points	Direct counts	
Observation intervals	3, 5, and 7 days	
Other observations, if any	Shape of fronds and Doubling time	
Indicate whether there was an exponential growth in the control	Yes, the dilution water control cell densities at test termination were 16.6x greater, than the dilution water control cell densities at test initiation.	
Were raw data included?	Replicate data were provided for frond number and dry weight.	

#### II. RESULTS and DISCUSSION:

#### A. INHIBITORY EFFECTS:

By 7 days, the percent inhibitions for mean live frond numbers were 3, 16, 36, 51, 66, and 74% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The percent inhibitions for area under the growth curve (biomass) were 3.8, 18.1, 30.9, 43.6, 59.0, and 72.1% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The percent inhibitions for growth rates were 1.0, 6.0, 15.9, 25.1, 38.5, and 47.6% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The percent inhibitions for dry weight were 3, 19, 28, 41, 57, and 65% at 0.10, 0.34, 0.73, 2.4, 8.2, and 24 mg ai/L, respectively, compared to the control. The NOAEC for all endpoints was 0.10 mg ai/L, the lowest test concentration.

Table 3: Effect of Chlormequat chloride on frond number of Duckweed, Lemna gibba G3

Treatment	Initial frond	Mean fron	d number at		
measured and (nominal)	number/test solution	3 days	5 days	7	days
concentration (mg ai/L)				frond number	% inhibition
Negative control	11	29.0	72.3	182.7	
0.10 (0.04)	11	28.0	69.7	177.7	3
0.34 (0.32)	11	26.7	58.7	154.3	16*
0.73 (1.0)	11	26.7	55.7	117.0	36*
2.4 (3.2)	11	25.7	48.7	90.3	51*
8.2 (10.0)	11	23.0	40.0	62.0	66*
24 (32.0)	11	17.0	32.3	48.0	74*
Reference chemical (if used)	N/A	N/A	N/A	N/A	N/A

<sup>\*</sup> Significantly reduced compared to the control (reviewer-estimated). N/A= not applicable

Table 4: Effect of Chlormequat chloride on growth of Duckweed, Lemna gibba G3

Treatment measured and (nominal) concentration (mg ai/L)	Initial frond number/test solution	Biomass (mean)	Biomass % Inhibition	Growth rate (mean)	Growth rate % Inhibition	Dry weight (mg, mean)	Dry weight % Inhibition
Negative control	11	8144		0.40		31.8	

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0.04 (0.10)	11	7836	3.8	0.40	1.0	31.0	3
0.34 (0.32)	11	6668	18.1*	0.38	6.0*	25.6	19*
0.73 (1.0)	11	5628	30.9*	0.34	15.9*	22.8	28*
2.4 (3.2)	11	4592	43.6*	0.30	25.1*	18.7	41*
8.2 (10.0)	11	3336	59.0*	0.25	38.5*	13.7	57*
24 (32.0)	11	2272	72.1*	0.21	47.6*	11.2	65*
Reference chemical (if used)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

<sup>\*</sup> Statistically significant reduction compared to the control (Dunnett-test,  $p \le 0.05$ ). N/A= not applicable

Table 5: Statistical endpoint values.

Statistical Endpoint	Frond No.	Area under the growth curve (biomass)	Growth rate	Dry weight
NOAEC (mg a.i./L)	Not determined	0.10	0.10	0.10
LOAEC (mg a.i./L)	Not determined	0.34	0.34	0.34
EC <sub>50</sub> (mg a.i./L) (95% C.I.) <sup>a</sup>	Not determined	5.3 (3.5-8.6)	28.0 (15.8-65.7)	5.7 (3.1-12.7)
EC <sub>10</sub> (mg a.i./L) (95% C.I.) <sup>a</sup>	Not determined	0.2 (0.1-0.3)	0.6 (0.3-1.1)	0.1 (0.03-0.3)
Reference chemical NOAEC EC <sub>50</sub>	N/A	N/A	N/A	N/A

<sup>&</sup>lt;sup>a</sup> Based on nominal concentrations.

#### **B. REPORTED STATISTICS:**

The Dunnett's test was used to compare treatment groups to the control. The NOAEC was determined using these statistical results. The area under the growth curve and growth rate formulae incorporate frond number and time to derive these endpoints. The  $EC_{50}$  values were determined using probit analysis. The statistical calculations were performed using the nominal concentrations.

#### C. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Frond number and dry weight data (the only endpoints for which replicate data were provided) were analyzed using the Chi-square and Shapiro-Wilks tests for normality and the Hartley and Bartlett's tests for homogeneity of variances. Data satisfied the assumptions of ANOVA, so the NOAEC values were determined using ANOVA, followed by William's test. These analyses were conducted using TOXSTAT statistical software. The EC<sub>x</sub> values were determined using non-linear regression via Nuthatch statistical software. Mean-measured concentrations were calculated by the reviewer using the data on pp. 38 and 39; the

N/A= not applicable

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value for the lowest concentration was determined using  $\frac{1}{2}$  LOD in place of the three replicates with measurements below the LOQ.

Frond Number:

EC<sub>05</sub>: 0.018 mg ai/L

95% C.I.: 0.0063-0.051 mg ai/L

EC<sub>50</sub>: 2.6 mg ai/L

95% C.I.: 1.8-3.7 mg ai/L

NOAEC: 0.04 mg ai/L Probit Slope: 0.763±0.0564

Dry Weight:

EC<sub>05</sub>: 0.016 mg ai/L

95% C.I.: 0.007-0.038 mg ai/L

EC<sub>50</sub>: 5.0 mg ai/L

95% C.I.: 3.8-6.5 mg ai/L

NOAEC: 0.04 mg ai/L

Probit Slope: 0.661±0.0375

#### D. STUDY DEFICIENCIES:

There were no study deficiencies.

#### E. REVIEWER=S COMMENTS:

Results of the reviewer's statistical verification were similar to the study author's. Differences are attributed to the different methods used and the fact that the reviewer used mean measured concentrations, whereas the study author used nominal. Replicate data were not provided for biomass and growth rate and the study author did not analyze frond number data separately; however, the reviewer's analysis showed that frond number was comparatively more sensitive than the study author-determined biomass endpoint.

The experimental start date was November 17, 2000 and the experimental termination date was November 24, 2000.

#### F. CONCLUSIONS:

This study is scientifically sound and is classified as ACCEPTABLE. Frond number was the most sensitive endpoint, with an EC $_{50}$  of 2.6 mg ai/L. All endpoints were adversely affected at all but the lowest concentration. The NOAEC for the study was 0.04 mg ai/L.

Frond Number:

EC<sub>05</sub>: 0.018 mg ai/L

95% C.I.: 0.0063-0.051 mg ai/L

EC<sub>50</sub>: 2.6 mg ai/L

ng ai/L 95% C.I.: 1.8-3.7 mg ai/L

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Dry Weight:

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EC<sub>50</sub>: 5.0 mg ai/L

95% C.I.: 3.8-6.5 mg ai/L

NOAEC: 0.04 mg ai/L

Probit Slope: 0.661±0.0375

Endpoints affected: Frond number, biomass, growth rate and dry weight

Most sensitive endpoint: frond number

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#### III. REFERENCES:

Chemikaliengsetz der Bundesrepublik Deutschland (ChemG), Anhang 1, in der Fassung der Bekanntmachung vom 25. Juli 1994 (BGB1. IS. 1703) mit Anderungen vom 27. September 1994 (BGB1 IS. 2705) und 14 Mai 1997 (BGB1 IS. 1060)

Davies, R.G. 1971. Computer Programming in Quantitative Biology, Academic Press, London.

Dunnett, C.W. 1955. A multiple comparison procedure for comparing several treatments with a control, Journal of the American Statistical Association 50, 1096-1121.

Dunnett, C.W. 1964. New tables for multiple comparisons with a control, Biometrics 20, 482-491.

EPA Guideline 712-C-96-156: OPPTS 850.4400 "Aquatic Plant Toxicity Test Using Lemna spp.", April 1996.

Finney, D.J. 1971. Probit Analysis, 3<sup>rd</sup> Edition, Cambridge University Press, London.

OECD Draft Guideline Lemna Growth Inhibition Test, June 1998

The OECD Principles of Good Laboratory Practice, adopted by Council on 26<sup>th</sup> November 1997 [C(97)186/Final], Environment Directorate, Organization for Economic Co-operation and Development, Paris 1998

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#### APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

frond number (7 day)

File: 5221fn Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE		DF	SS	MS	F	
Between	1	6	53577.905	8929.651	254.783	
Within	(Error)	14	490.667	35.048		
Total		20	54068.571			

Critical F value = 2.85 (0.05, 6, 14)

Since F > Critical F REJECT Ho: All groups equal

frond number (7 day)

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DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment TRANSFORMED MEAN CALCULATED IN GROUP IDENTIFICATION MEAN ORIGINAL UNITS T STAT SIG control 182.667 0.04 177.667 182.667 177.667 1.034 154.333 154.333 3 0.34 5.862 \* 13.585 \* 0.73 117.000 2.4 90.333 8.2 62.000 24 48.000 117.000 4 90.333 19.102 \* 5 62.000 24.963 \* 48.000 27.860 \*

Dunnett table value = 2.53 (1 Tailed Value, P=0.05, df=14,6)

frond number (7 day)

File: 5221fn Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment NUM OF Minimum Sig Diff % of DIFFERENCE
GROUP IDENTIFICATION REPS (IN ORIG. UNITS) CONTROL FROM CONTROL GROUP IDENTIFICATION 3 control 0.04 3 0.34 3 0.73 3 2.4 3 8.2 3 24 3 2 12.229 6.7 6.7 28.333 6.7 65.667 6.7 92.333 6.7 120.667 6.7 134.667 5.000 3 12.229 4 12.229 12.229 5 12.229 6 12.229

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frond number (7 day)

File: 5221fn Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GR	OUP			ORIGINAL	TRANSFORMED	ISOTONIZED
		IDENTIFICATION	N	MEAN	MEAN	MEAN
	1	control	3	182.667	182.667	182.667
	2	0.04	3	177.667	177.667	177.667
	3	0.34	3	154.333	154.333	154.333
	4	0.73	3	117.000	117.000	117.000
	5	2.4	3	90.333	90.333	90.333
	6	8.2	3	62.000	62.000	62.000
	7	24	3	48.000	48.000	48.000

frond number (7 day)
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WILLIAMS	TEST	(Tentonic	regression	( [abom	TABLE	2	OF	2
WILLITAMS	TEST	LISOCOTILE	redression	Moder	TADLE	4	OF	4

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
control	182.667				
0.04	177.667	1.034		1.76	k = 1, v = 14
0.34	154.333	5.862	*	1.85	k = 2, v = 14
0.73	117.000	13.585	*	1.88	k = 3, v = 14
2.4	90.333	19.102	*	1.89	k = 4, v = 14
8.2	62.000	24.963	*	1.90	k = 5, v = 14
24	48.000	27.860	*	1.91	k = 6, v = 14

Note: df used for table values are approximate when v > 20.

#### Estimates of EC%

Estimate	95% Bou	nds	Std.Err.	Lower Bound	
	Lower	Upper		/Estimate	
0.018	0.0063	0.051	0.22	0.35	
0.054	0.022	0.13	0.18	0.41	
0.34	0.18	0.63	0.13	0.54	
2.6	1.8	3.7	0.078	0.69	
	0.018 0.054 0.34	Lower 0.018 0.0063 0.054 0.022 0.34 0.18	Lower Upper 0.018 0.0063 0.051 0.054 0.022 0.13 0.34 0.18 0.63	Lower Upper 0.018 0.0063 0.051 0.22 0.054 0.022 0.13 0.18 0.34 0.18 0.63 0.13	Lower Upper /Estimate 0.018 0.0063 0.051 0.22 0.35 0.054 0.022 0.13 0.18 0.41 0.34 0.18 0.63 0.13 0.54

Slope = 0.763 Std.Err. = 0.0564

!!!Poor fit: p = 0.0019 based on DF= 4.0 14.

5221FN: frond number (7 day)

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Observed vs.	Predicted	Treatment	Group	Means		
Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00 0.0400 0.340 0.730 2.40 8.20 24.0	3.00 3.00 3.00 3.00 3.00 3.00 3.00	183. 178. 154. 117. 90.3 62.0 48.0	188. 173. 141. 125. 95.9 66.0 43.2		100. 91.6 74.9 66.2 50.9 35.0 22.9	0.00 8.39 25.1 33.8 49.1 65.0

!!!Warning: EC5 not bracketed by doses evaluated.

dry weight

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#### ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	1158.996	193.166	225.135
Within (Error)	14	12.013	0.858	
Total	20	1171.010		

Critical F value = 2.85 (0.05,6,14) Since F > Critical F REJECT Ho:All groups equal

dry weight

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	DUNNETTS TEST - TA	BLE 1 OF 2	Ho:Control <tr< th=""><th>eatment</th><th></th></tr<>	eatment	
GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
		21 022			
1	control	31.833	31.833		
2	0.04	31.000	31.000	1.102	
3	0.34	25.633	25.633	8.198	*
4	0.73	22.800	22.800	11.944	*
5	2.4	18.733	18.733	17.321	*
6	8.2	13.733	13.733	23.932	*
7	24	11.233	11.233	27.238	*

Dunnett table value = 2.53 (1 Tailed Value, P=0.05, df=14,6)

dry weight

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	DUNNETTS TEST - 1	ABLE 2 OF	2 Но:	Control <t< th=""><th>reatment</th></t<>	reatment
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)		DIFFERENCE FROM CONTROL
1	control	3			
2	0.04	3	1.913	6.0	0.833
3	0.34	3	1.913	6.0	6.200
4	0.73	3	1.913	6.0	9.033
5	2.4	3	1.913	6.0	13.100
6	8.2	3	1.913	6.0	18.100
7	24	3	1.913	6.0	20.600

dry weight File: 5221d

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		WILLIAMS TEST (Isoto	nic	regression model	TABLE 1 OF	7 2
GRO	UP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
	1	control	3	31.833	31.833	31.833
	2	0.04	3	31.000	31.000	31.000
	3	0.34	3	25.633	25.633	25.633
	4	0.73	3	22.800	22.800	22.800
	5	2.4	3	18.733	18.733	18.733
	6	8.2	3	13.733	13.733	13.733
	7	24	3	11.233	11.233	11.233

dry weight File: 5221d

Transform: NO TRANSFORMATION

	WILLIAMS TEST	(Isotonic	regression	model)	TABLE 2 O	F 2
	IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
-						
	control	31.833				
	0.04	31.000	1.102		1.76	k = 1, v = 14
	0.34	25.633	8.197	*	1.85	k = 2, v = 14
	0.73	22.800	11.943	*	1.88	k = 3, v = 14
	2.4	18.733	17.320	*	1.89	k = 4, v = 14
	8.2	13.733	23.931	*	1.90	k = 5, v = 14
	24	11.233	27.236	*	1.91	k = 6, v = 14

s = 0.926

Note: df used for table values are approximate when v > 20.

Data Evaluation Report on the Acute Toxicity of Chlormequat chloride to Lemna gibba G3

_		_	
PMRA Submission Number	{}	EPA MI	XID Number 467152-21

Estimates	of	EC%
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Parameter	Estimate	e 95% Bounds		Std.Err.	Lower Bound	
		Lower	Upper		/Estimate	
EC5	0.016	0.0070	0.038	0.17	0.43	
EC10	0.058	0.029	0.12	0.14	0.50	
EC25	0.48	0.30	0.76	0.097	Ò.63	
EC50	5.0	38	6.5	0.055	0.77	

Slope = 0.661 Std.Err. = 0.0375

Goodness of fit: p = 0.064 based on DF= 4.0 14.

5221D : dry weight

5221D : dry weight

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs.	Pred. %Control	%Change
0.00	3.00	31.8	32.5	-0.714	100.	0.00
0.0400	3.00	31.0	29.9	1.14	91.7	8.26
0.340	3.00	25.6	25.4	0.241	78.0	22.0
0.730	3.00	22.8	23.1	-0.307	71.0	29.0
2.40	3.00	18.7	19.0	-0.265	58.4	41.6
8.20	3.00	13.7	14.4	-0.709	44.4	55.6
24.0	3.00	11.2	10.6	0.611	32.6	67.4

<sup>!!!</sup>Warning: EC5 not bracketed by doses evaluated.